The Influence of Hypothesis Disconfirmation on Attribution Error in Juror Perceptions of Confession Evidence

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Statement of Sources

I declare that this report is my own original work and that contributions of others have been duly acknowledged.

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Table of Contents

Tables

The Influence of Hypothesis Disconfirmation on Attribution Error in Juror Perceptions of Confession Evidence

Kelly Porter

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Abstract

Jurors are vulnerable to an array of cognitive biases that can result in an over-belief of confession evidence. A combination of automatic acceptance, self-serving expectations and the Fundamental Attribution Error may result in an initial hypothesis of guilt, with confirmation bias reinforcing this with the evaluation of subsequent evidence. There were two main aims of this research. First, to examine the extent to which mock jurors are sensitive to inconsistencies in confessions. Second, to test the capacity of a hypothesis disconfirmation intervention to enhance sensitivity to inconsistencies by encouraging mock jurors to more critically evaluate confession evidence. The online study followed a 2 (confession strength: weak, strong) x 3 (hypothesis disconfirmation: pre-confession, post-confession, control) between-subjects design. Participants read a police report detailing the facts of a crime and a signed confession statement (either weak and inconsistent with the police report, or strong and consistent). Participants in hypothesis disconfirmation conditions listed up to 10 reasons why someone might falsely confess. Confession strength had a significant main effect on perceived consistency of confession evidence ($p<.001$), verdict ($p=.004$) and verdict preference ($p=.006$), while perceived likelihood of guilt bordered on significance ($p=.053$). Neither the hypothesis disconfirmation nor the strength x hypothesis disconfirmation interaction had any significant main effects on any of the dependent variables ($p>.05$). It seems, mock jurors were sufficiently sensitive to inconsistencies in the confession evidence, leaving little room for the hypothesis disconfirmation to have any effect. Before hypothesis disconfirmation is labelled as an ineffective technique for encouraging jurors to more critically evaluate confession evidence, its efficacy should first be tested in cases where jurors' over-belief in confession evidence is more pronounced.

A confession is considered the gold standard of evidence in a criminal investigation (Kassin, 2012). Once a confession is elicited, the investigation is often deemed closed, with investigators ceasing to search for incriminating (or exculpatory) evidence (Drizin & Leo, 2004). A confession, whether true or false, increases the likelihood of conviction, and thus has a major impact on the life of the suspect and the provision of justice. False confessions are therefore problematic. First, they increase the risk of an innocent defendant being imprisoned. In over 25% of DNA exonerations, suspects have been convicted on the basis of a false confession (Innocence Project, 2016a). Furthermore, false confessions were implicated in 12 of 17 DNA exonerations for inmates on death row (Innocence Project, 2009). For example, Earl Washington Jr., was wrongfully convicted for rape and murder in 1984 after being coerced to confess by investigators. He spent more than 16 years in prison before his exoneration, escaping his execution by only 9 days (Innocence Project, 2016b). Second, and perhaps less obviously, by increasing the risk of wrongful prosecution and conviction, false confessions also increase the risk that dangerous perpetrators remain undetected. Although various safeguards have been implemented to reduce (a) the risk of false confessions, and (b) the likelihood that a false confession will lead to wrongful prosecution, false confessions remain an issue (Kassin & Sukel, 1997). One major problem is that jurors are not sufficiently critical of confession evidence. False confessions invoke strong inferences of guilt, prompting a chain of cognitive biases that strengthen the attribution of guilt, despite the suspect's innocence (Kassin, 2012). Our focus was to test a simple hypothesis disconfirmation intervention intended to reframe jurors' mindset, and attenuate the judgemental biases that can lead from a confession to an automatic assumption of guilt when jurors fail to appropriately critique confession evidence.

There are a number of questions that need to be addressed before juror perceptions of false confessions can be explored. Why do people confess to crimes that they did not commit? Are some types of false confessions more obvious than others? Why are false confessions so believable? And how do false confessions lead to wrongful convictions?

Why People Falsely Confess.

A number of factors increase the likelihood of a suspect falsely confessing, including: duress, coercion, intoxication, diminished capacity, cognitive impairment, ignorance of the law, the threat or infliction of harm, promises of leniency, misunderstandings and language barriers (Innocence Project, 2016a; Kassin & Sukel, 1997). Most false confessions are the product of prolonged interrogative processes in which the suspect is subjected to long periods of isolation and fatigue, which increases vulnerability to manipulation and impedes complex decision-making abilities (Blagrove, 1996; Harrison & Horne, 2000; Kassin & Sukel, 1997). Investigators sometimes present false evidence in attempt to elicit a false confession, directly deceiving and manipulating the suspect. Suspects are more likely to surrender when they believe that the police have strong evidence against them, and false evidence increases the risk that the suspect will internalise blame for the crime in question (Kassin, 2005). One thing many false confession cases share is that, at the time, the suspect believed that complying with interrogators by claiming responsibility for the crime in question was more beneficial than maintaining their innocence (Innocence Project, 2016a). False confessors are often over-confident in the transparency of their innocence, believing that truth will prevail and DNA evidence will prove their innocence (Kassin & Sukel, 1997). However, anecdotal evidence and case studies demonstrate that this is not true. Even when suspects

withdraw their confessions, it is still compelling evidence in court. Further, although juveniles and individuals with mental illnesses are most vulnerable to falsely confessing, cognitively-normal adults account for the majority of false confessors (Drizin & Leo, 2004). Thus, the potential for false confessions to occur, and to facilitate miscarriages of justice, is not just limited to any particular demographic.

Types of False Confessions.

Kassin and Wrightsman (1985) identified three types of false confessions: voluntary, coerced-compliant and coerced-internalised. Voluntary false confessions are self-incriminating statements offered in the absence of external pressure. For example, a suspect may voluntarily confess in order to protect the real perpetrator or gain notoriety. Voluntary confessions are more accurately detected than other types of false confession, as they are less detailed than police-induced false confessions (Kassin & Wrightsman, 1985). Coerced-compliant confessions are acts of compliance by suspects who know that they are truly innocent. The suspect usually confesses in order to escape an aversive interrogation, avoid an explicit or implied threat of harm or to gain a promised or implied reward (Kassin, 2005). For example, in the Central Park Jogger case, each of the five teenage boys confessed with the expectation that they would be going home afterwards. Finally, coerced-internalised false confessions occur when the suspect comes to believe that he or she truly committed the crime. This is often a product of false evidence ploys, fatigue, confusion, and the formation of false memories in response to highly suggestive procedures (Kassin, 2005). Coerced-internalised false confessions seem the most unlikely and are thus the hardest for jurors to comprehend. For example, Paul Ingram was charged with rape and multiple satanic cult crimes, including the murder of new born babies. Interrogations took over six months, and during this time

Ingram was hypnotised, exposed to graphic crime details not in the public domain, informed by a police psychologist that sexual offenders often repress the memories of their crimes, and the minister of his church urged him to confess. Ingram eventually 'recalled' his crimes, describing them in rich detail. He pleaded not guilty but was sentenced to prison. However, there was no corroborating evidence and an expert reviewing the case concluded that Ingram had been brainwashed. To prove his point, he accused Ingram of an imaginary crime. While Ingram initially denied his involvement, he later confessed and even embellished the story (Kassin & Kiechel, 1996).

Believability of False Confessions.

Police-induced false confessions (i.e., coerced-compliant and coerced-internalised confessions) are particularly believable. Innocent suspects are often fed details of the crime through leading questions and overheard conversations, allowing for richly-detailed confessions. False confessions often contain details about the crime that are out of the public domain. To an unsuspecting observer, the confession statement appears voluntary, accurate and the product of personal experience, giving the observer no reason to doubt its veracity (Kassin, 2005). While confessions produced in response to the threat of violence are often acknowledged as being involuntary, those made in response to promises of leniency are perceived as more voluntary and thus more indicative of guilt (Kassin & Kiechel, 1996).

How False Confessions Lead to Wrongful Convictions.

False confessions facilitate wrongful conviction in three ways. First, and most obviously, false confessions provide self-incriminating evidence, which contradicts the idea that the suspect is innocent. Second, false confessions can taint other evidence in the trial, and even prevent exculpatory evidence from being

presented (Kassin, 2012). Third, people are insufficiently critical of confession evidence (Palmer, Burton, Barnett & Brewer, 2014). While the first point is quite self-explanatory, the second two points require elaboration.

The Effects of Confessions on Other Evidence

False confessions may suppress or alter perceptions of exculpatory evidence, preventing it from being properly considered (or even presented) in the courtroom. Hasel and Kassin (2009) looked at the effects of confession evidence on eyewitness identifications. Participants viewed a simulated crime video followed by a lineup. After making a decision (either identifying the perpetrator or rejecting the lineup), participants were told that one of the non-identified lineup members had confessed. Of those who originally rejected the lineup, 50% now identified the "confessor". Of those who originally made an identification, 61% *changed* their selection to identify the confessor. Similarly, polygraph (Elaad. Ginton & Ben-Shakhar, 1994), fingerprint (Dror & Charlton, 2006) and handwriting experts (Kukucka & Kassin, 2013) have been shown to change their professional opinions when informed that a suspect had confessed. Seemingly, any evidence involving an element of subjective human judgement might be tainted by the knowledge of a confession (Kukucka & Kassin, 2013). Further, in terms of suppressing exculpatory evidence, Hasel and Kassin (2009) speculate that upon hearing a confession, individuals providing alibis may doubt their recollection of events and withdraw their statements. Thus, the damaging ramifications of false confessions extend beyond the incriminating evidence of the confession itself. Preventing false confessions therefore serves two functions. First, it removes a falsely incriminating piece of evidence from the equation. Second, it improves the reliability of evaluations of other evidence.

Public Perceptions of False Confessions

Large discrepancies exist between public perceptions of false confessions and their occurrence in reality. Costanzo and colleagues (2010) demonstrated that members of the general public believed that there was a 52% chance that a jury would convict a suspect who falsely confessed to a murder in the absence of any other incriminating evidence. In contrast, Drizin and Leo's (2004) comprehensive analysis of 125 real exoneration cases involving false confessions found that when suspects confessed to a crime and then pleaded 'not guilty', the conviction rate was 81%, even when there was no corroborating evidence and even in the presence of evidence that clearly contradicted the confession. Thus, potential jurors (i.e., members of the general public) significantly underestimate the potency of confession evidence.

Impact of False Confessions on Juror Verdicts

False confessions are particularly compelling, in part because individuals are poor at identifying them. People are not adept at detecting deception. Neither lay people nor trained professionals are able to distinguish truth from lies at high levels of accuracy (Appleby, Hasel & Kassin, 2013). While false confessions are more the product of compliance than deception, people are similarly inept at distinguishing between true and false confessions. Kassin, Meissner and Norwick (2005) found that the ability of jury-eligible samples and police investigators to accurately discriminate between true and false videotaped confessions of inmates was little better than chance, (ranging from 42% to 64%).

Confession evidence has a substantial impact on jury verdicts. Although it may seem common sense that people would believe science over self-report, confession evidence trumps eyewitness and character testimony, alibis, and even

DNA evidence (Kassin & Neumann, 1997). Confessions significantly increase conviction rates, even when jurors perceive the confession to be involuntary, and even in the absence of corroborating evidence (Kassin & Sukel, 1997). Compared to no-confession control groups, mock-jurors show an increased bias towards guilty verdicts when presented with inadmissible confession evidence, despite claiming that the confession has no influence on their decision-making (Kassin & Sukel, 1997). When people do recognise the use of coercive tactics in the extraction of a confession, they often do not associate this situational pressure with an accompanying increase in the risk of falsely confessing (Henkel, Coffman & Dailey, 2008; Leo & Liu, 2009). As the prosecution presents their evidence before the defence, and confessions can taint perceptions of other evidence, dubious confession evidence can influence perceptions of all subsequent evidence, before the defence has the opportunity to provide context as to how the confession was elicited. As discussed later, this order of presentation has the potential to promote confirmation bias in the processing of confession evidence.

Minimising Wrongful Convictions due to False Confessions

Safeguards have been implemented to reduce the rate of wrongful convictions resulting from false confessions, with specific measures applied to protect vulnerable populations. For example, minors must be accompanied by a professional advocate, preferably an attorney, throughout all investigative procedures (Kassin, 2012). Investigation and interrogation procedures have also been reformed, with deceptive tactics like using false evidence to extract a confession being prohibited in some (though not all) jurisdictions, and the implementation of corroboration requirements providing an incentive for investigators to continue seeking physical evidence after producing a confession (Kassin, 2012).

Most jurisdictions require interrogation processes to be filmed, with recordings made available to judges and juries (Kassin, 2008). This encourages investigators to refrain from employing coercive tactics (and defence lawyers to withhold from unduly claiming coercion). Filmed interrogation procedures provide context as to how a confession was elicited, potentially highlighting situational forces at play (Appleby et al., 2013; Kassin & Sukel, 1997). However, the camera perspective bias undermines the utility of this information source. People are more sensitive to situational factors used to elicit a false confession when both the suspect and the interrogators are visible on the camera, as opposed to when the focus is wholly on the suspect, and illusory correlation prompts jurors to attribute the cause of the confession to the most salient stimulus (i.e., the suspect; Lassiter & Geers, 2004). Permitting jurors to access video footage of entire interrogation processes lets them observe the conditions under which the confession was elicited and the source of the details it contains, allowing them to make more informed judgements of voluntariness and guilt (Lassiter, Geers, Handley, Weiland & Munhall, 2002). However, video-recordings are not enough to prevent false confessions.

If a confession is disputed, a specific process must be adhered to. First, a judge determines the admissibility of the confession in a preliminary hearing. Confessions may be excluded if they were obtained in response to physical violence, the threat of punishment or harm, promises of leniency, or without notifying of the suspect of their Miranda rights (Kassin & Sukel, 1997). Confessions deemed admissible will either go to court without informing the jury of the dispute, or the jury will be asked to make independent judgements regarding the voluntariness of the confession. If perceived as involuntary the jury should disregard it. The court, therefore, places

faith in the jury's ability to distinguish true from false confessions, and their ability and willingness to disregard false confessions.

While these measures are somewhat successful in reducing wrongful convictions based on false confessions, none of them directly target jurors' ability to critique confession evidence. Expert testimony attempts to do this through introducing a qualified psychologist to increase jurors' awareness of the individual characteristics, interrogation tactics and situational pressures that make falsely confessing more likely (Costanzo & Leo, 2007). Jurors can then decide how much weight should be assigned to the confession in question (Costanzo, Shaked-Schroer & Vinson, 2010). However, there are also concerns that expert testimony causes jurors to overestimate the likelihood of a false confession (Costanzo et al., 2010). Though, some studies suggest this likelihood is already overestimated, with potential jurors estimating that 19-24% of all confessions are false (Costanzo et al., 2010). By educating jurors on the psychology of false confessions, expert testimony may instead work to create a more realistic perception of false confession evidence (Costanzo et al., 2010). However, a key issue for expert testimony is the timing of its presentation (Costanzo et al., 2010). The prosecution presents their evidence before the defence, meaning that jurors have already processed and evaluated the confession evidence before being presented with the expert testimony. Moreover, jurors seem unlikely to re-evaluate the confession evidence in light of advice given by the expert witness (Ross & Anderson, 1982). Therefore, it could potentially be more beneficial for a method of intervention to be provided earlier in the evaluation process. A key issue with the aforementioned safeguards is that they fail to address the cognitive biases that influence jurors' initial evaluations of confession evidence, and therefore influence perceptions of subsequent evidence.

Juror Decision Making

The jury – who evaluate the credibility of confession evidence - is the last barrier between an innocent confessor and imprisonment (Costanzo et al., 2010). When jurors enter a courtroom, they bring with them pre-existing beliefs, ideas, expectations and cognitive biases. These can shape interpretations of evidence and influence verdict decisions.

Jurors are advised to be open-minded during the presentation of evidence, and to refrain from forming an opinion regarding guilt until all evidence has been presented (Nickerson, 1998). However, research in human cognition suggests that jurors will probably form an opinion early in the trial (Nickerson, 1998). Once that initial opinion is formed, an array of basic cognitive biases may contribute to misinterpretation of evidence and, specifically, an over-belief of confession evidence. One common misinterpretation involves evaluations of confession strength. The following sections will explore this misinterpretation and the cognitive biases involved in evaluating confession strength in greater depth.

Evaluating confession strength. Jurors may lack sensitivity to factors relevant to assessing confession strength (Palmer et al., 2014). If an intervention is to improve juror decisions making, it must increase jurors' sensitivity to the strength of the evidence, not just increase overall scepticism. Sensitivity in this context may refer to knowledge of factors influencing the elicitation of a confession, and the use of that knowledge to evaluate confession evidence (Penrod & Cutler, 1989). Scepticism may cause jurors to give insufficient and inappropriate weight to actual confession evidence (Penrod & Cutler, 1989).

Malloy and Lamb (2010) speculated that although mock-jurors question the credibility of inconsistent eyewitness testimony and alibi statements (see Brewer &

Burke, 2002), they are less sceptical of inconsistent confession evidence. Numerous studies have provided empirical evidence consistent with this idea (see Najdowski, Bottoms & Vargas, 2009; Redlich, Ghetti & Quas, 2008). Malloy and Lamb (2010) suggested that inconsistencies in other types of evidence may lead jurors to question the motives of witnesses or the prosecution, such as framing the suspect. In contrast, it is harder for jurors to generate plausible alternative motivations for a confession. Thus, jurors fail to question the credibility of inconsistent confession evidence (Henkel et al., 2008). Palmer and colleagues (2014) tested this idea, demonstrating that mock-jurors do in fact question the credibility of inconsistent confession evidence, but only to the extent that they are aware of inconsistencies. The inability to identify inconsistencies could be due to an array of cognitive biases that are triggered during the evaluation of confession evidence, such as automatic acceptance, truth bias, self-serving expectations, the fundamental attribution error and confirmation bias (Kassin, 2012).

Acceptance and truth bias. Spinoza (1677/1982) proposed that all assertions are automatically accepted as truth through the process of comprehension. Once accepted, individuals engage in a more effortful evaluation process. Belief in the truth of the assertion is then updated if evaluation finds it to be untrue (Spinoza, 1677/1982). Thus, the tendency to believe a statement precedes the opportunity to critically evaluate it. When individuals lack time, energy and/or conclusive evidence, they may fail to un-accept the ideas that they had involuntarily accepted previously (Gilbert, 1991). Only then can they go about the process of critically evaluating it. According to this view, upon hearing a confession, jurors will automatically accept it as true. In contrast, Descartes (1644/1984) suggested that the comprehension of an idea is initially met with a period of uncertainty and indecision

while the idea is evaluated. A combination of knowledge, past experiences and expectations bias the initial uncertainty towards believing or disbelieving a statement, depending on the context (Street & Richardson, 2015). As the "myth of physical interrogation" (Leo, 2008) suggests, it is popular belief that a person of sound mind will not confess to a crime they did not commit unless tortured. This is likely to bias jurors towards trusting confession evidence. While there might not be an automatic acceptance of truth, under some circumstances truth may be the favoured alternative when evaluating a statement (Street & Richardson, 2015). For example, a defendant's denial of being in a certain area at the time of a crime might not be met with an automatic acceptance, but their confession seems to be.

An early bias towards truth is adaptive in many environments. Most people tell the truth most of the time. Thus, a truth bias permits accurate judgements most of the time (DePaulo, Kashy, Kirkendol, Wyer & Epstein, 1996; Serota, Levine & Boster, 2010). Truth bias may be the default method of acceptance when an individual is uncertain, or if there is no motivation to engage in more effortful evaluations of the information received (Street & Richardson, 2015). This truth bias might also contribute to poor performance in detecting deception (Bond & DePaulo, 2006) and discriminating between true and false confessions (Kassin et al., 2005).

Regardless of whether assertions are automatically accepted as truth or heavily influenced by knowledge, past experience and expectations, these approaches all suggest that jurors will be likely to believe confession evidence as being truthful.

The acceptance of confession evidence is also influenced by the expectation that other people will engage in self-serving behaviour (Kassin, 2005). Any statement that contradicts self-interest is particularly believable. Thus, confession

evidence seems particularly diagnostic of guilt, especially considering the strong inhibiting effects of the consequences of confessing (Appleby et al., 2013; Palmer et al., 2014).

The Fundamental Attribution Error. Attribution theory provides a framework for understanding interpretations and inferences drawn from observing others' behaviour (Kelley, 1973; Tetlock, 1985). The Fundamental Attribution Error (FAE) is the pervasive phenomena through which people attribute others' behaviour to dispositional (i.e., individual) characteristics while underestimating the influence of situational determinants of behaviour (Ross & Anderson, 1982). For example, upon seeing a car speeding down the highway, one might assume that the driver is an irresponsible idiot, when in fact the driver could be rushing his pregnant wife to hospital. Evaluating behaviour at face value, without consideration of situational influences, promotes hasty conclusions and erroneous attributions (Kassin, 2005; Ross & Anderson, 1982). Jurors are not immune to this tendency and evaluations of confession evidence can be influenced by FAE, especially given the limited knowledge of the context in which the confession was elicited.

FAE was prominent in Bierbauer's (1979) study into perceptions of behaviour in Milgram's (1963) classic obedience study. Beirbauer found that his participants grossly underestimated the degree to which Milgram's subjects would yield to the situational forces that compelled obedience in Milgram's paradigm. Instead, participants attributed the behaviour of Milgram's subjects to dispositional factors, such as being morally inept. They also assumed that they themselves would never bow to the pressure of situational forces, and therefore failed to understand why Milgram's subjects did. Similarly, jurors perceive that they would never confess to a crime that they did not commit, despite situational forces and constraints, and thus

struggle to comprehend why others would. This idea is supported by Costanzo and colleagues' (2010) survey, showing that 91.3% of participants were adamant that they would not falsely confess when pressured by police.

One factor driving the FAE is a heavy reliance on heuristics and schemas in social situations (Kelley, 1973). Schemas provide frameworks for efficiently analysing information about an action in order to arrive at a plausible attribution. Causal schemas are employed when inferring causes of behaviour based on limited information: as is typically the case when a juror observes a single instance of alleged behaviour by a defendant within the context of a trial (Kelley, 1973). Without multiple behavioural observations, jurors are unable to compare actions to assess whether the behaviour is uncharacteristic of the defendant. Consequently, they rely on schemas based on past experiences, which generally suggest that confessions are indicative of guilt.

The availability heuristic is another potential mechanism underlying FAE. The availability heuristic occurs when individuals rely on readily available information instead of examining alternatives (Kelley, 1973). To most people, the association between confessing to a crime and being guilty is likely to be more salient than the association between confessing and any other motivation. Furthermore, when observing behaviour, the individual is more salient than the environmental forces influencing the behaviour (Kelley, 1973). As a result, it is easier to attribute the actor's behaviour to disposition rather than environmental factors. Thus, lack of information regarding environmental forces makes it much easier for jurors to attribute the production of a confession to the defendant's guilt, without regard for situational influences. Kelley's (1973) augmentation principle also suggests that individuals are more likely to attribute behaviour to the actor (cf.

situational factors) when an action has obvious constraints, costs, sacrifices or risks involved. Falsely confessing to a crime has obvious consequences, making it harder to generate plausible alternative motivations. Regardless of the specific mechanism involved, FAE is likely to result in jurors attributing the confession to the defendant's guilt.

Confirmation bias. Once an initial hypothesis has been established, it has the potential to influence judgements of all subsequent and related information (Nickerson, 1998). Confirmation bias occurs when an initial belief is enhanced through the biased search for, recollection, assimilation, and evaluation of information (Ross, 1977; Ross & Anderson, 1982). Individuals give more weight to arguments supporting initial beliefs while neglecting to gather or discounting contradictory information (Nickerson, 1998). This bias accounts for the endurance of beliefs in the face of substantial contradictory evidence (Ross & Anderson, 1982).

Information presented early in evaluation processes is given more weight than information shown later and helps to shape initial opinions, which in turn, colour judgements of subsequent evidence (Jones & Goethals, 1972; Nickerson, 1998; Nisbett & Ross, 1980; Webster, 1964). In the courtroom, this is reflected in the tendency of jurors to favour a certain verdict quite early in the trial (Devine & Ostrom, 1985). The biased search for information means that initial beliefs are highly persistent and resistive to change (Nickerson, 1998). Pennington and Hastie (1993) support this idea, showing increased mock-juror recall for statements that supported (cf. contradicted) their verdict. This partially explains why jurors retain initial impressions of guilt in final verdicts, despite the presentation of strong exculpatory evidence (Lawson, 1968; Nickerson, 1998; Ross, 1977). Furthermore, mock-jurors who selectively use evidence to support one argument over another are

more confident in their verdicts than mock-jurors who evaluate evidence for both arguments simultaneously (Nickerson, 1998).

Doherty and Mynatt (1986) suggested that human cognition is restricted to only considering one concept at a time. Consequently, once a hypothesis is formed individuals tend to fixate on it. Alternatively, people may simply fail to generate alternate hypotheses. Inadequate effort may undermine an extensive search for alternate explanations (Baron, 1985; Kanouse, 1972; Nickerson, 1998). Although, confirmation bias is reduced when participants are overtly asked to consider alternative options, participants tend not to generate these alternatives without explicit instruction (Nickerson, 1998).

This confirmation bias means that initial assumptions of guilt (prompted by the array of cognitive processes previously discussed) is often retained. Bacon (1620/1939) proposed that "the first conclusion colours and brings to conformity with itself all that comes with it" (p. 36). Individuals tend not to consistently update and re-evaluate their beliefs in light of new information (Ross & Anderson, 1982). Even if a juror's initial hypothesis of guilt is undermined, they are unlikely to revisit and re-assess all of the information that was evaluated under that initial belief.

Hypothesis Disconfirmation

Most individuals consider a situation only to the extent necessary to make superficial meaning of it (Perkins, Allen & Hafner, 1983). Once meaning is achieved there is no reason to continue searching for an explanation. Continuing to search for alternatives might reveal contradictory evidence, undermining the understanding gained from the initial explanation. The desire to avoid cognitive dissonance reinforces the tendency for early closure. Individuals, therefore, tend adopt an explanation before extensively searching for alternatives (Kruglanski, 1980; Perkins

et al., 1983). While most beliefs are remarkably resilient, logical and empirical challenges to existing hypotheses can change beliefs (Ross & Anderson, 1982). Hypothesis disconfirmation is a technique that forces individuals to generate explanations as to why an initial hypothesis might be incorrect (Brewer, Keast & Rishworth, 2002; Koriat, Lichtenstein & Fischoff, 1980). Hypothesis disconfirmation techniques help individuals overcome the tendency to give insufficient consideration to ideas that differ from their initial hypothesis (Brewer et al., 2002). Hypothesis disconfirmation mitigates confirmation bias and reduces the over-confidence in judgements that comes from failing to adequately consider alternatives (Nickerson, 1998). The efficacy of hypothesis disconfirmation has been demonstrated in task domains such as general knowledge, predicting personal outcomes, or other future events (Griffin, Dunning & Ross, 1990; Hoch, 1985; Koriat et al., 1980).

Based on the knowledge that only one hypothesis tends to be considered at a time and that hypotheses are assumed to be true quite early in evaluation processes, it can be suggested that reasoning may be improved if individuals are encouraged to consider alternative hypotheses that challenge the initial hypothesis quite early in the evaluation process (Nickerson, 1998). The timing of the presentation of a hypothesis disconfirmation intervention may influence its success. Tetlock (1985) found that accountability (i.e., making jurors justify their verdicts) only reduced judgement biases when mock-jurors were informed of the need to justify their responses *before* evaluating case evidence, and not when mock-jurors were informed of their need to justify their responses *after* evaluating the evidence. Thus, changing the mindset of jurors prior to exposing them to confession evidence may disrupt the attributional biases involved in arriving at an assumption of guilt by encouraging a more critical

initial evaluation of the confession evidence. Furthermore, Tetlock's (1985) results suggest that changing the mindset of jurors may be able to prevent judgemental biases but not address them retrospectively.

However, one issue that needs to be considered in the implementation of a hypothesis disconfirmation, is the potential for a 'backfire effect' (Nyhan & Reifler, 2010). Examining alternate explanations may work to strengthen the initial hypothesis, especially if participants struggle to generate a specific number of alternate explanations (Robinson & Johnson, 1996).

This Study

Most of the research surrounding false confessions has focused on why innocent suspects falsely confess and the extent to which jury-eligible samples are able distinguish between true and false confession evidence. However, there is currently no research on implementing an intervention that could challenge juror perceptions of confession evidence through targeting the cognitive biases that lead to an automatic initial hypothesis of guilt. The following research therefore sought to overcome this gap in the literature by evaluating the efficacy of a hypothesis disconfirmation intervention. More specifically, this study has two main aims. First, to examine the extent to which mock-jurors are sensitive to inconsistencies in confession evidence, and second, to test a simple hypothesis disconfirmation exercise intended to reframe the mindset of jurors and attenuate the judgemental biases that can lead from a confession to an automatic assumption of guilt when jurors fail to appropriately critique confession evidence (i.e., to potentially increase juror sensitivity to indices of confidence strength).

Despite a number of previous studies finding that jurors overlook consistencies in confession evidence (Malloy & Lamb, 2010; Najdowski et al., 2009;

Redlich et al., 2008), as far as it is known, this is only the second study to examine juror sensitivity to confession strength by manipulating consistency. Palmer and colleagues (2014) found that mock-jurors are sensitive to inconsistencies in confession evidence, but only to the extent that the inconsistencies are detected. In an attempt to replicate these findings, we selected the presence of inconsistencies as our manipulation of confession strength. We included both a strong (consistent) and a weak (inconsistent) confession condition to determine if perceptions of evidence strength and defendant guilt vary according to the presence of inconsistencies between a confession and verifiable case facts outlined in a police report. We expected that mock-jurors in strong confession conditions would perceive the confession evidence as being stronger than those in weak confession conditions, and thus vote 'guilty' more often.

If jurors are prone to over-believe confession evidence, ideally a hypothesis disconfirmation intervention would enhance mock-juror sensitivity to inconsistencies in confession evidence, reducing the perceived strength of confession evidence for weak but not strong confessions. This would also be reflected in fewer guilty verdicts in weak compared to strong confession conditions. In line with Tetlock's (1985) research, we expected that the timing of the hypothesis disconfirmation intervention would influence its efficacy. Therefore, we presented the intervention to different groups at different stages during the process of confession evaluation: prior to evaluating the confession evidence, after evaluating the confession evidence or not at all (i.e., a control condition). If judgemental biases can be prevented but not reversed as Tetlock (1985) suggested, we would expect to see a reduction in the perceived strength of confession evidence in the pre-confession disconfirmation condition, but not in the post-confession or control

conditions. Ideally, the presentation of the hypothesis disconfirmation will not simply make mock-jurors more sceptical of confession evidence as increased scepticism would reduce the utility of such an intervention. If the intervention did make mock-jurors more sceptical, we would expect to see a general decrease in the perceived strength of confession evidence.

The current study also included a measure of need for cognition (NFC) as an exploratory variable. NFC refers to an individual's intrinsic motivation to engage in effortful cognitive activities (Cacioppo & Petty, 1982). As jurors attend to and evaluate trial-relevant information in order to arrive at a verdict, it is possible that individual differences in NFC may influence their styles of information processing and decision making (Sommers & Kassin, 2001). Thus, we measured NFC in this study to explore the degree to which mock-jurors are differentially influenced by confession evidence as a function of NFC. We made no specific predictions relating to interactions between NFC and our intervention, but included it as a potential individual difference variable.

Method

Participants and Design

173 participants began the study but 24 were removed due to incomplete data. The final study involved 149 participants (117 female), with participants randomly assigned relatively equally across the six experimental conditions in a 2 (confession strength: weak, strong) x 3 (disconfirmation: pre, post, control) between-subjects design. First year psychology undergraduates from the University of Tasmania (n=110) were rewarded with research credit for their participation, while other participants entered the draw to win a $50 voucher. Ages ranged from 18-67

(*M*=26.89, *SD*=11.51) with 18 being the minimum due to the legal minimum age requirement for participating as a member of a jury in Australia.

Materials

The study was presented in an online survey format using LimeSurvey. A one page mock police report (Appendix A) outlined the verifiable facts of a break-and-enter burglary and the police procedures that were followed, including obtaining statements from the homeowners; scanning the crime scene for evidence; results from forensic analyses; the interviewing of suspects; and obtaining a confession from the defendant.

Two versions of a typed confession (signed by the defendant) were used in the study (Appendix B), varying in degrees of strength. The strong confession contained details consistent with the details outlined in the police report, while the weak confession included a number of details inconsistent with the police report. Both versions of the confession were similar in regards to who, what, when, where and how the crime was committed, with minor variations in how the house was entered, the exact time of day, and the items that were stolen from the house in the weak confession.

The hypothesis disconfirmation intervention (Appendix C) explained that sometimes people confess to crimes that they did not commit. The intervention then asked participants to think about and describe the single most plausible reason they could imagine as to why someone might falsely confess before rating how plausible they thought this explanation was on a 5-point scale (1=not at all plausible, 5=extremely plausible). The second part of the hypothesis disconfirmation intervention asked participants to list up to nine other potential reasons why someone might confess to a crime that they did not commit, and rate each reason for

plausibility. While the first stage of the intervention was made to be compulsory, the second stage was left as optional so as to avoid the risk of backfire effects if participants are unable to generate a specific number of explanations.

A questionnaire (Appendix 4) asked participants whether they would give the defendant a *guilty* or *not guilty* verdict, their confidence in the verdict they had just given (0=0% to 10=100%), how likely they think it is that the defendant actually committed the crime regardless of the verdict they had just given (0=0% to 10=100%), and how consistent the confession was with the case facts (1=extremely inconsistent to 10=extremely consistent). The questionnaire also asked for demographic information such as age, sex and whether or not the participant had ever been called for jury duty.

Cacioppo, Petty and Kao's (1984) Need for Cognition Scale (NCS) assessed differences in motivation to engage in cognitively complex tasks. The scale required participants to rate on a 9-point scales (1=very strong disagreement to 9=very strong agreement) the degree to which the 18 items best described themselves. Half the items of the NCS were reverse scored to prevent response bias from influencing ratings. Participant ratings were scored from -4 to 4 and summated. Total scores above 0 represented a high need for cognition and scores below 0 reflected a low need for cognition. The NCS included items such as 'I would rather do something that requires little thought than something that is sure to challenge my thinking abilities', 'I really enjoy a task that involves coming up with new solutions to problems' and 'I feel relief rather than satisfaction after completing a task that requires a lot of effort'.

Procedure

Participants accessed the online survey and completed the study individually. Participants in the control condition read the case description outlined in the police report before reading either the weak or strong confession statement and continuing to complete the questionnaire and NCS. Participants in the pre-confession hypothesis disconfirmation condition were asked to read the police report before completing the hypothesis disconfirmation intervention, reading either the strong or weak confession statement and following on to complete the questionnaire and NCS. Participants in the post-confession hypothesis disconfirmation condition read the police report, and either the strong or weak confession before completing the hypothesis disconfirmation intervention and completing the questionnaire and NCS.

Results

Data Screening and Manipulation Check

To check that our confession strength manipulation was effective we analysed differences between weak and strong confession groups in their perceptions of the consistency between the police report and confession evidence. An independent samples t-test revealed that the mean consistency rating (as seen in Table 1) for participants in weak confession conditions was significantly lower than for participants in strong confession conditions, which was a moderate to large effect, $t(147) = -3.74$, $p < .001$, $f = 0.31$. As frequentist approaches to null hypothesis significance testing consider only the extremeness of data under the null hypothesis, with no consideration of evidence in favour of the alternative hypothesis, we also conducted a Bayesian analysis of the data. Bayesian analysis shows that this effect was approximately 90 times more likely to occur if a real effect existed compared to the null hypothesis ($BF_{10} = 90.90$). Thus, our manipulation was successful.

Disconfirming reasons given by mock-jurors in hypothesis disconfirmation conditions were scored for plausibility. Responses were considered plausible so long as they provided a logical explanation as to why someone might confess to a crime that they did not commit. All participants provided plausible answers, so data analyses were based on the full sample. Data was screened to make sure that the assumptions for all analyses were met. All assumptions were met, so no corrections were necessary. On the basis that NFC might relate to the effectiveness of our manipulation, we checked for differences in NFC between conditions (see Table 2). There were no significant differences in NFC between strength conditions, $F(1, 138)=.409$, $p=.524$, $f=.05$, or between hypothesis disconfirmation conditions, $F(2, 138)=.716$, $p=.491$, $f=.10$, thus we did not consider NFC scores any further. We also found no correlation between the number of explanations generated by participants in hypothesis disconfirmation conditions (N=96) and confidence in verdict, $r=.056$, $p=.587$.

Verdict

A three-way hierarchical loglinear analysis assessed the association between confession strength, presentation of hypothesis disconfirmation intervention and verdict. Hierarchical loglinear analysis is an extension of the chi-square test, used to analyse the relationships between two or more categorical variables. A linear model is fit to the data that predicts the number of expected cases in a given category. Essentially, it is an ANOVA for categorical data (Field, 2013). The final model retained only the 2 (strength) x 2 (verdict) association, $\chi^2(8, N=142) =8.432$, $p=.004$, indicating that the verdict was influenced by the strength (consistency) of the confession evidence, but not by the hypothesis disconfirmation intervention or interaction between confession strength and hypothesis disconfirmation.

Table 1

Mean Rating of Perceived Consistency for each Experimental Condition

Confession Strength	Hypothesis Disconfirmation	*n*	*M*	*SD*	*95% CI*
Weak	Control	20	5.35	2.13	[4.42, 6.28]
	Pre-Confession	24	5.83	2.12	[4.98, 6.68]
	Post-Confession	26	5.04	2.20	[4.19, 5.89]
	Total	70	5.40	2.15	[4.90, 5.90]
Strong	Control	30	7.00	2.27	[6.19, 7.81]
	Pre-Confession	26	6.81	2.15	[5.98, 7.64]
	Post-Confession	23	6.43	2.56	[5.38, 7.48]
	Total	79	6.77	2.30	[6.26, 7.28]
Total	Control	50	6.34	2.34	[5.69, 6.99]
	Pre-Confession	50	6.34	2.17	[5.74, 6.94]
	Post-Confession	49	5.69	2.45	[5.00, 6.38]
	Total	149	6.13	2.33	[5.76, 6.50]

Note. CI = confidence interval.

Cross tabulation analyses showed that 65% 95%CI [54,76] of participants in strong confession conditions provided a guilty verdict compared to only 40% [29,52] of participants in strong confession conditions. Thus, the odds of a guilty verdict were 2.73 [1.41,5.31] times higher in the strong (cf. weak) confession conditions. Bayesian analysis found that the main effect of strength was 26 times more likely to occur if a real effect existed compared to the null hypothesis (BF_{10}=26.35), and the

effect of hypothesis disconfirmation obtained with the given data was twice as likely if the null was true, compared to a true effect (BF_{01}=1.98).

Verdict Preference

The verdict preference of participants was assessed using two variables: a dichotomous verdict decision (guilty, not guilty) and a 10-point confidence-in-verdict scale (0=0% confidence, 10=100% confidence).

Table 2

Mean Need for Cognition Score for each Experimental Condition

Confession Strength	Hypothesis Disconfirmation	*n*	*M*	*SD*	*95%CI*
Weak	Control	19	9.53	21.02	[0.08, 18.98]
	Pre-Confession	23	14.35	16.02	[7.80, 20.90]
	Post-Confession	24	13.13	14.92	[7.16, 19.10]
	Total	66	12.52	17.09	[8.40, 16.64]
Strong	Control	29	12.03	20.49	[4.57, 19.49]
	Pre-Confession	26	15.69	17.39	[9.01, 22.37]
	Post-Confession	23	15.09	17.70	[7.86, 22.32]
	Total	78	14.15	18.52	[10.04, 18.26]
Total	Control	48	11.04	20.52	[5.23, 16.85]
	Pre-Confession	49	15.06	16.60	[10.41, 19.71]
	Post-Confession	47	14.09	16.19	[9.46, 18.72]
	Total	144	13.40	17.84	[10.49, 16.31

Note. CI= confidence interval.

This process created a new 22-point verdict-preference scale, with -10.5 reflecting complete confidence in a not guilty verdict and 10.5 reflecting complete confidence in a guilty verdict (Tenney, MacCoun, Spellman & Hastie, 2007). The verdict preference scale has been used frequently in mock jury research (e.g., Kassin & Wrightsman, 1979; Kerr, Bull, MacCoun, & Rathborn, 1985). It is a more sensitive measure than the dichotomous verdict and can be analysed using standard parametric tests. A 2(strength) x 3(hypothesis disconfirmation) between-subjects ANOVA assessed the effects of confession strength and hypothesis disconfirmation presentation on verdict preference. Consistent with the verdict measure, there was a moderate main effect of confession strength on verdict preference, F (1,143) =7.67, p=.006, f=0.23, Consistent with the verdict measure, there was a moderate main

Table 3

Proportion of Participants Giving Guilty Verdicts

Confession Strength	Hypothesis Disconfirmation	*n*	*Proportion of Participants*	*SE*	*95% CI*
Weak	Control	20	0.45	0.11	[0.23, 0.67]
	Pre-Confession	24	0.42	0.10	[0.22, 0.62]
	Post-Confession	26	0.35	0.09	[0.17,0.53]
	Total	70	0.40	0.06	[0.29, 0.52]
Strong	Control	30	0.67	0.09	[0.50,0.84]
	Pre-Confession	26	0.73	0.09	[0.56, 0.90]
	Post-Confession	23	0.52	0.10	[0.32, 0.72]
	Total	79	0.65	0.05	[0.54, 0.76]

Note. CI = confidence interval.

effect of confession strength on verdict preference, F (1,143) =7.67, p=.006, f=0.23, with the mean verdict preference of weak confession conditions, as listed in Table 4, reflecting fewer guilty verdicts than strong confessions conditions. A Bayesian ANOVA revealed that these results were 9 times more likely to occur if a real effect was to exist than if the null were true (BF_{10}=8.73). There was no significant main effect of hypothesis disconfirmation, F (2,143) =1.29, p=.279, f=0.13, or strength x hypothesis disconfirmation interaction, F (2,143) =.298, p=.743, f=.06. Bayes analysis shows that the effect of hypothesis disconfirmation is 3 times more likely under the null (BF_{10}=0.269), while the interaction was twice as likely if a real effect was to exist (BF_{10}=1.173), however this is likely a remnant of the strength effect. These results support the idea that mock-jurors are sensitive to inconsistencies in confession evidence, yet there is no evidence that the hypothesis disconfirmation intervention affected decision-making.

Perceived Likelihood of Guilt

A 2(strength) x 3(hypothesis disconfirmation) between-subjects ANOVA was conducted to assess the effect of presentation of hypothesis disconfirmation and confession strength on perceived likelihood of guilt. While not significant, the main effect of strength on perceived likelihood of guilt bordered on significance and the effect size exceeded the cut-off for a small effect, F (1,143) =3.80, p=.053, f=.16. There is some evidence to suggest that, consistent with the verdict and verdict preference measures, the strong confession condition produced higher perceptions of likelihood of guilt than the weak confession conditions (please refer to Table 5 for descriptive statistics). The main effect of hypothesis disconfirmation on perceived likelihood of guilt was non-significant, F (2,143) =.67, p=.512, f=.10, as was the interaction between confession strength and hypothesis disconfirmation, F (2,143)

=1.63, *p*=.200, *f*=.15. A 2(strength) x 3(hypothesis disconfirmation) between-subjects Bayesian ANOVA, revealed that the strength effect obtained is 1.3 (BF_{10}=1.3) times more likely if a real effect exists, while the hypothesis disconfirmation effect and strength x hypothesis disconfirmation interaction were 7 (BF_{10}=.14) and 5 (BF_{10}=0.19) times more likely under the null hypothesis respectively. Consistent with verdict preference, there evidence to support the idea that jurors are aware of inconsistencies in the confession evidence, but again no evidence to support any effect of hypothesis disconfirmation.

Table 4

Mean Verdict Preference for Each Experimental Condition

Confession Strength	Hypothesis Disconfirmation	*n*	*M*	*SD*	*95% CI*
Weak	Control	20	-0.46	7.31	[-3.66, 2.74]
	Pre-Confession	24	-0.97	6.53	[-3.58, 1.64]
	Post-Confession	26	-1.75	6.73	[-4.34, 0.84]
	Total	70	-1.11	6.75	[-2.69, 0.47]
Strong	Control	30	2.68	6.10	[0.50, 4.86]
	Pre-Confession	26	2.98	6.19	[0.60, 5.36]
	Post-Confession	23	0.18	6.77	[-2.59, 2.95]
	Total	79	2.05	6.37	[0.65, 3.45]
Total	Control	50	1.42	6.72	[-0.44, 3.28]
	Pre-Confession	50	1.09	6.60	[-0.74, 2.92]
	Post-Confession	49	-0.84	6.75	[-2.73, 1.05]
	Total	149	0.57	6.72	[-0.51, 1.65]

Note. CI = confidence interval

Table 5

Mean Ratings of Perceived Likelihood of Guilt for Each Experimental Condition

Confession Strength	Hypothesis Disconfirmation	*n*	*M*	*SD*	*95% CI*
Weak	Control	20	5.65	2.32	[4.71, 6.59]
	Pre-Confession	24	4.92	2.57	[4.06, 5.78]
	Post-Confession	26	5.50	2.49	[4.66, 6.34]
	Total	70	5.34	2.45	[4.77, 5.91]
Strong	Control	30	6.30	2.18	[5.52, 7.08]
	Pre-Confession	26	6.42	1.36	[5.58, 7.26]
	Post-Confession	23	5.43	1.88	[4.55, 6.31]
	Total	79	6.09	1.88	[5.68, 6.50]
Total	Control	50	6.04	2.24	[5.42, 6.66]
	Pre-Confession	50	5.70	2.15	[5.10, 6.30]
	Post-Confession	49	5.47	2.20	[4.85, 6.09]
	Total	149	5.74	2.19	[5.39, 6.09]

Note. CI = confidence interval.

Discussion

This research had two aims. First, we examined the extent to which mock-jurors were sensitive to inconsistencies in confession evidence. The results supported our first hypothesis regarding a main effect of strength, with mock-jurors in weak confession conditions rating the confession evidence as weaker (i.e., less consistent) and giving significantly fewer guilty verdicts that mock-jurors in strong confession conditions. These results contradict a mixture of anecdotal and empirical

evidence that has previously suggested that mock-jurors overlook inconsistencies in confession evidence (Malloy & Lamb, 2010; Najdowski et al., 2009; Redlich et al., 2008). 2009). Our results do, however, support Palmer et al.'s (2014) findings, demonstrating that, at least in some contexts, mock-jurors are sensitive to inconsistent confession evidence, and can adjust their perceptions of defendant culpability accordingly. Therefore, despite jurors' tendency to over-believe questionable confessions (i.e., those obtained under coercive conditions; Henkel et al., 2008; Kassin & Sukel, 1997), our results indicate that jurors are not entirely insensitive to factors related to confession strength.

Our second aim was to test if a hypothesis disconfirmation intervention was capable of encouraging greater critical evaluation of confession evidence by mock-jurors, thus enhancing their sensitivity to any inconsistencies. The results did not support the hypothesised benefits of hypothesis disconfirmation, with the intervention having no effect on any of the dependent variables. We found no main effects of hypothesis disconfirmation, and more importantly, no interaction between hypothesis disconfirmation and confession strength (i.e., no evidence that hypothesis disconfirmation enhanced sensitivity to confession strength). This was surprising due to the efficacy of hypothesis disconfirmation in a range of other domains, including the combatting of overconfidence in eyewitness identifications (Brewer et al., 2002). Before considering reasons why the intervention did not have an effect in this instance, we will first revisit the theory behind our reasoning for conducting this study.

Jurors have a tendency to over-believe confession evidence thanks to an array of cognitive biases. Based on the literature we speculated that first, in order to comprehend a confession, the juror must accept it to some degree (Spinoza,

1677/1982). Thus, in order to comprehend the evidence, the juror forms an initial hypothesis suggesting that the confession is truthful. Second, people expect others to behave in a self-serving manner, and therefore find it difficult to comprehend why a defendant might falsely confess, especially given that the consequences of doing so are obvious (Kassin, 2005). Third, the FAE reflects a human tendency to interpret the behaviour of others at face value, attributing it to the disposition of the actor while failing to consider the situational factors that may have influenced the actor's behaviour (Ross, 1977). This suggests that jurors will largely be blind to situational forces such as the coercive tactics used by investigators in the elicitation of the confession statement. The combination of these three factors is likely to lead a juror to assume that the defendant is guilty quite early within a trial (Devine & Ostrom, 1985). Research on confirmation bias demonstrates that once people form an impression, it is often hard to overcome, even when strong evidence suggests that the initial impression was wrong (Nickerson, 1998; Ross, 1977). Jurors are likely to overlook, discount or assimilate new information that is not congruent with their initial impressions of guilt, and all subsequent evidence is likely to be evaluated in light of this initial hypothesis (Nickerson, 1998). Once jurors have decided that a confession is equated with guilt, this impression is likely to shape their interpretations of all subsequent evidence (Costanzo et al., 2010). Furthermore, once confession evidence is presented and an impression of guilt is formed, jurors are not likely to readjust their impressions of guilt when subsequent evidence is shown (Kalven & Zeisel, 1971; Lawson, 1968). This process is particularly problematic for innocent defendants who have falsely confessed, and so we have tried to implement an intervention to challenge the cognitive biases of jurors by forcing them to consider alternate explanations for confessing using hypothesis disconfirmation

techniques. We thought that when presented before reading a confession statement, the hypothesis disconfirmation intervention might work by interrupting automatic acceptance, self-serving expectations and FAE, allowing the juror to more critically evaluate the confession and not fixate on an initial hypothesis of guilt. By presenting the intervention after the confession evidence, while this initial assumption of guilt might have already been formed, confirmation bias may have been prevented, allowing jurors to readjust their initial hypotheses of guilt. However, we found no evidence to suggest that the intervention had any effect on mock-juror perceptions of confession evidence.

There are six potential reasons why the hypothesis disconfirmation intervention may not have had an effect in the current study, despite its demonstrated efficacy in other domains. First, the materials in this study may have been too simplistic, making the strength manipulation too obvious. The task may have been too easy, meaning that participants did not need to think critically to evaluate the confession evidence and thus did not require the help of the intervention. Second, the vast majority of the participants (113 out of 144) in this study scored relatively high on NFC (i.e., above the midpoint of the scale). Thus, these people may have been pre-disposed to evaluate the evidence more thoroughly. However, NFC appeared to have no influence on perceptions of confession evidence, with no differences found between high and low NFC participants on any of the dependent variables (admittedly, given the imbalance between NFC groups, this must be interpreted with caution).

Third, if participants detected inconsistencies in the confession evidence, they may have been prompted to self-generate alternative explanations for the confession (see Palmer et al., 2014). This spontaneous generation of alternate

explanations may have resulted in fewer guilty verdicts being rendered by mock-jurors in weak confession groups. If this was the case, explicitly instructing participants to generate alternate explanations, as is the nature of hypothesis disconfirmation, would be redundant. This possibility is in line with Palmer and colleagues' (2014) proposal that when no alternative explanation for confessing (other than being guilty) was made salient to mock-jurors, inconsistencies may have prompted them to spontaneously generate their own alternate explanations. The extent to which mock-jurors are able to generate alternate explanations may influence the extent to which inconsistencies undermine the credibility of the confession evidence. Participants who struggle to generate explanations may experience a backfire effect, with the hypothesis disconfirmation strengthening their initial hypothesis regarding guilt. However, our study found no significant correlation between the number of alternative explanations and confidence in the verdict given, so this effect could be trivial at best.

Fourth, this study solely looked at inconsistencies between the information within the confession statement and the case facts outlined in the police report. However, the effects of inconsistencies on juror judgements may vary for different types of inconsistencies (Najdowski et al., 2009). For example, previous studies have shown that contradictions within a witness statement in court undermine credibility more so than providing new information in court that was absent from previous statements (Berman & Cutler, 1996). This means that the capacity of a hypothesis disconfirmation intervention to enhance the critical evaluation of confession evidence by jurors may vary as a function of the type of inconsistencies present. In the absence of other guidelines, we selected a manipulation akin to Palmer and colleagues (2014), but perhaps it would have been useful to see if the

hypothesis disconfirmation intervention could alert jurors to potentially less obvious sources of inconsistencies. Fifth, we must entertain the possibility that the hypothesis disconfirmation may simply be an ineffective intervention in this context. Sixth, given the FAE, hypothesis disconfirmation might be more effective in cases where the confession is tainted by coercion (i.e., it might prompt jurors to consider these environmental factors more carefully).

It is possible that an intervention like the hypothesis disconfirmation technique used in the current study might simply encourage jurors to be more sceptical of confession evidence (i.e., reducing the perceptions of strength and likelihood of guilt for both strong and weak confession evidence). However, the absence of a main effect suggests that the hypothesis disconfirmation intervention did not have this effect on mock-jurors. Thus, although we did not find the anticipated effect on sensitivity, we also did not find any evidence of an effect on scepticism – which is a positive.

Limitations and Future Research

As mentioned earlier in the discussion, the current experimental materials were quite simplistic, which may have undermined the hypothesis disconfirmation intervention by making the task too easy. Inconsistencies in the weak confession may have been so obvious that participants did not need to critically evaluate the confession in order to detect them, creating substantial doubt around the confessor's culpability. This doubt could have limited the capacity of the hypothesis disconfirmation to have any effect in increasing critical evaluation of the confession evidence. A more complex or ambiguous case may produce different results. We plan to replicate this experiment with more complex/ambiguous materials to see if

the simplicity of the current materials did reduce the efficacy of the hypothesis disconfirmation.

The external validity of the experiment may be limited by its mock-jury format and predominantly undergraduate sample. While mock jury studies are high in internal validity (Kapardis, 2014), concerns have been raised about the generalisability of such studies (Bornstein, 1999). For example, outcomes might differ based on characteristics such as mock-juror samples (e.g., undergraduates vs. community dwelling adults), research settings (e.g., laboratory vs. courtroom), trial medium (e.g., written summaries vs. more realistic simulations), trial elements included (e.g., the presence or absence of deliberation), dependent variables included (e.g., dichotomous verdict decision vs. continuous probability of guilt judgements), and consequences of the task (e.g., a hypothetical decision vs. a decision with real outcomes) (Bornstein, 1999). Empirical studies have found that undergraduate participants do not always generalise to the population as a whole (Sears, 1986), and the infrequency of undergraduates participating in actual juries may be problematic (Bray & Kerr, 1982). As 74% of the current sample were undergraduate students, it is possible that they have a greater capacity for critical thinking than the general population. Further, as most were Psychology students, it is possible that knowledge of cognitive biases and heuristics, and critical thinking, may have reduced their susceptibility to engage in such biases. However, Bornstein's (1999) meta-analytic results show that only five of 26 studies found a significant main effect of sample type, with students typically being more lenient in their verdicts than other sample types. Similarly, very few differences emerged between other variables of concern in mock jury studies. Thus, despite the intuitively plausible concerns with using student samples and simplistic materials, Bornstein's (1999) work suggests that the

results obtained from these designs may be generalisable. However, they should also be interpreted with caution. Diamond (1997) suggested a two stage model for conducting mock jury studies. Stage one should be simple research using simple written materials and student samples, while stage two should use more representative methods such as recordings of real trials and real juror samples. While acknowledging the absence of an effect in the current study, if future studies were to determine that hypothesis disconfirmation could be effective in influencing juror perceptions of confession evidence, it might be useful to follow-up with more representative samples, and see if this affects the deliberation process. Furthermore, a more complex method involving the presentation of multiple pieces of evidence may allow inferences to be made regarding the efficacy of the hypothesis disconfirmation intervention to disrupt confirmation bias in the evaluation of subsequent evidence.

The simplicity of the research method may also have influenced the efficacy of the hypothesis disconfirmation intervention. In a real trial, confession evidence would not be presented in isolation. Presenting only confession evidence may have a number of effects. First, the absence of more ambiguous and/or exculpatory evidence might make it easier for participants to evaluate confession evidence, thus increasing their sensitivity to inconsistencies. Second, it may reduce the interplay between evidence types. Given the demonstrated capacity for confession evidence to affect juror perceptions of other evidence (Dror & Charlton, 2006; Elaad et al., 1994; Hasel & Kassin, 2009; Kukucka & Kassin, 2013), the simplicity of the evidence in the current study means that the verdict decision obtained might not reflect the verdict reached if all evidence were presented. In other words, the presence of a confession increases the perceived strength of other evidence, thus increasing guilty

verdicts. Third, it reduces the complexity of the case, and possibly the allure of a confession (i.e., as the most clear-cut index of guilt in an ambiguous decision-making task).

Future research could also implement a repeated-measures design. This could test initial hypotheses of guilt against final verdict decisions, determining if the intervention is capable of changing perceptions of guilt at an individual level. It would also be interesting to see if hypothesis disconfirmation might prevent people from bowing to situational pressure within group deliberations. It might work to make mock-jurors more open to the opinions of other jurors since they have already considered alternate explanations, and thus allow them to readjust their initial hypotheses regarding culpability.

Implications

Currently, there are no known interventions directly targeting jurors' cognitive biases in an effort to prevent them from influencing evaluations of confession evidence. Kassin (2008) recognised that we need to improve the way in which judges and juries evaluate confession evidence, and suggested two ways in which this could be done. First, interrogations should be videotaped, with full recordings made available to judges and juries to provide context as to how the confession was produced. Theoretically, this should alert triers of fact to procedural impropriety, and allow them to adjust their perceptions of the confession appropriately. However, research by Lassiter and Geers (2004) shows that videorecording interrogations is not that simple, and camera perspective bias influences juror perceptions of the interrogation, and, perhaps more importantly, research shows that even when jurors perceive a confession as less voluntary and claim that the confession did not influence their decision-making, it still does

(Kassin & Sukel, 1997). This is why we need to change the way jurors perceive confession evidence by directly targeting underlying cognitive processes. Second, expert witnesses could help to highlight areas of concern surrounding the production of a confession and the contents of the confession itself. Expert witness testimony is likely to be introduced in a trial by the defence, after the confession evidence has already been presented. This means that jurors have already evaluated any confession evidence, and already arrived at their initial hypothesis as to whether or not the defendant is guilty (Nickerson, 1998). It is unlikely that jurors are going to search their memories and re-evaluate all of the previously presented evidence in light of any new information introduced by the expert witness, and thus the initial hypothesis is likely to remain (Ross & Anderson, 1982). An intervention early in the evaluation process could be beneficial for targeting juror perceptions before that initial hypothesis is formed.

While this study found no effects of hypothesis disconfirmation on mock-jurors' perceptions of evidence strength and defendant culpability, this was in a situation where mock-jurors were apparently already sensitive to confession strength. Before hypothesis disconfirmation is labelled as an ineffective technique for encouraging jurors to more critically evaluate confession evidence, its efficacy should first be tested in cases where jurors' over-belief in confession evidence is more pronounced.

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Appendix A

Police Report/Case Summary

Please carefully read the following case summary:

Official Police Report

Case Number: 193485 **Date:** 21/04/16

Reporting Constable: Constable J. Hulme

Report Prepared By: Sergeant P. House

Type of Incident: Break and enter/burglary

Location of Incident: 14 View Street, Palm Cove

Case Facts:

On 16/04/2016 at approximately 1040 hours a call was received reporting a break and enter burglary at the address of 14 View Street, Palm Cove, and a vehicle was dispatched.

Constable John Hulme arrived at the scene at 1100 hours and the home owners' statement was promptly taken. The home owners allegedly left the house at 0830 hours before returning just after 1000 hours. They entered the house through the front door and noticed that the lounge room window had been smashed. After scanning the house for missing items it was apparent that jewellery, including a pearl necklace and diamond earrings, was missing from the bedroom dresser, a Toshiba Ultrabook laptop was missing from the study, a Canon EOS 6D DSLR camera was missing from the third shelf of the bookcase located in the left-hand corner of the study, and the sound system had been removed from the lounge room.

Constable Hulme scanned the property for evidence. Footprints were found on the path to the left hand side of the house leading from the front yard to the backyard. A print was taken and photographic evidence was collected. A small sample of blood was collected from the smashed lounge room window, which was located to the left of the backdoor. No fingerprints were found.

Constable Hulme proceeded to question neighbours who were home at the time. It was reported that a white Toyota Hilux had been sighted on multiple occasions lurking in the street, although no suspicious activity was noted during the timeframe in which the alleged burglary occurred.

Based on similarities to other break and enter burglaries in the suburb of Palm Cove in previous weeks, a list of potential suspects was compiled.

On 18/04/2016 the main suspect, Michael Finch, was brought in to the station for questioning. Mr Finch was well known to the New South Wales Police Force due to being implicated in previous offences of burglary. Mr Finch provided a confession. A statement was prepared by Constable Hulme and signed by the defendant in the presence of Constable Hulme and Constable Laura Matthews.

On 20/04/2016 forensic DNA and impression analysis reports were returned from the laboratory. It appeared that the shoe print matched the size of Mr Finch's feet, however DNA evidence obtained from the blood sample proved to be inconclusive.

Appendix B

Strong (Consistent) Confession Statement

Someone has confessed to the crime described a moment ago. Their confession is provided below. Please read it carefully.

Case No.: 193485

Defendant Statement

Statement of: Mr. Michael Finch

Constables in attendance: Constable J. Hulme, Constable L. Matthews

Date of affidavit: 18/04/16

I, Michael Finch of 23 Star Street, West Sydney, affirm as follows:

I gave this statement at 2:30pm Monday 18th April 2016 at Wentworthville Police Station

At approximately 9:15am on April 16th, I arrived at the residence of 14 View Street, Palm Cove. I knocked on the door to see if anyone was home, and walked around the side of the house and entered the backyard.

I smashed the window to the left hand side of the back door and entered the house into the lounge room.

I went to the bedroom and took a pearl necklace, diamond earrings, and two gold rings.

I then went to the study and took a laptop and charger, as well as a camera.

I took the sound system from the lounge room, got in my car – a white Toyota Hilux – and drove off.

I took the stolen goods to a friend's house on the corner of Eddington and Gunn Streets.

Signature of defendant M. Finch

Signature of attending Constables J. Hulme L. Matthews

Weak (Inconsistent) Confession Statement

Someone has confessed to the crime described on the previous page. Their confession is provided below. Please read it carefully.

Case No.: 193485

Defendant Statement

Statement of: Mr. Michael Finch

Constables in attendance: Constable J. Hulme, Constable L. Matthews

Date of affidavit: 18/04/16

I, Michael Finch of 23 Star Street, West Sydney, affirm as follows:

I gave this statement at 2:30pm Monday 18th April 2016 at Wentworthville Police Station

At approximately 10:30am on April 16th, I arrived at the residence of 14 View Street, Palm Cove. I knocked on the door to see if anyone was home, and walked around the side of the house and entered the backyard.

I smashed the window second to the right of the back door and entered the house into the lounge room.

I went to the bedroom and took a pearl necklace, diamond earrings, and two gold rings.

I then went to the study and took a laptop and charger, as well as an iPad.

I took the sound system from the lounge room, got in my car – a white Subaru Impreza – and drove off.

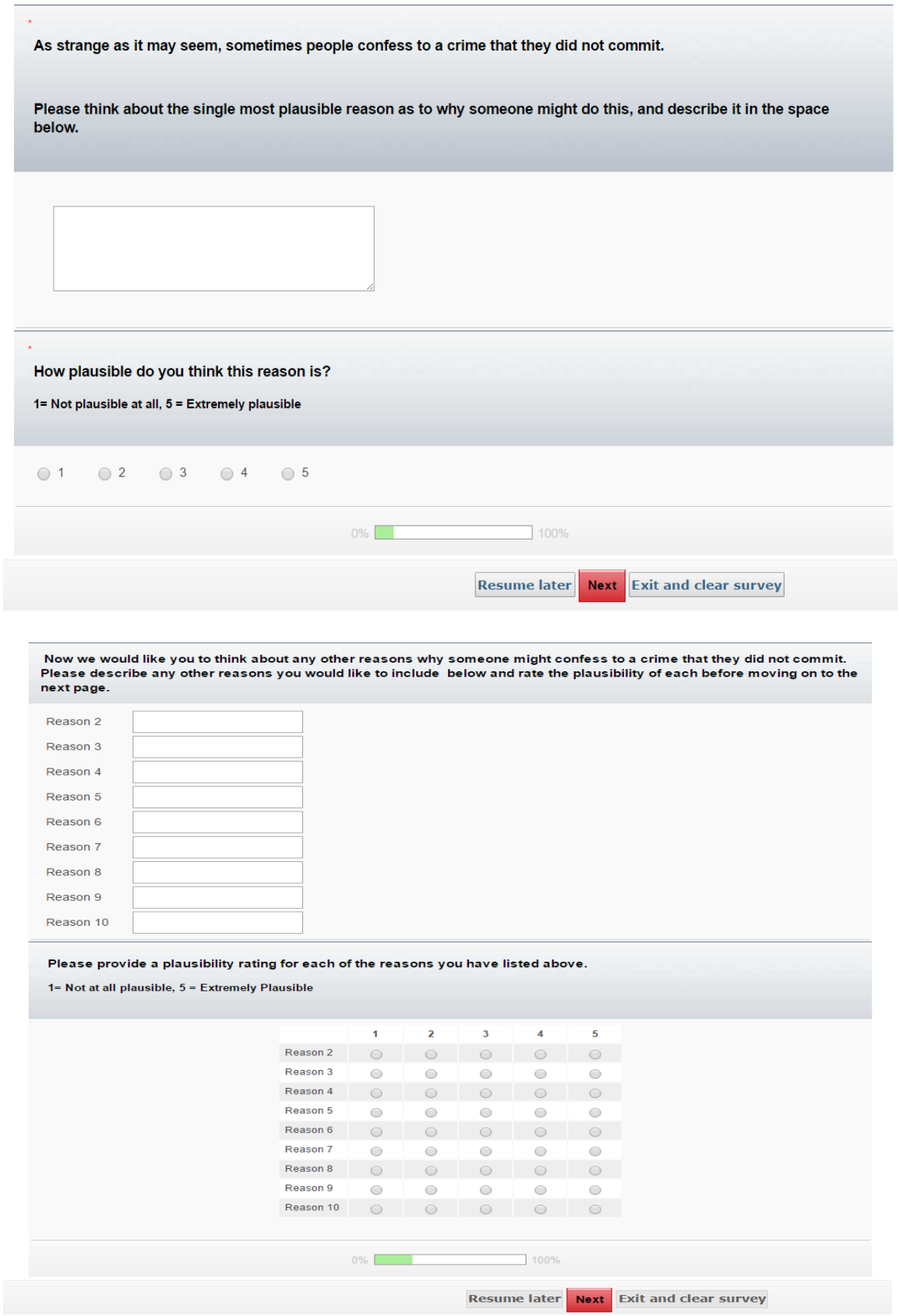
I took the stolen goods to a friend's house on the corner of Eddington and Gunn Streets.

Signature of defendant M. Finch

Signature of attending constables L. Matthews J. Hulme

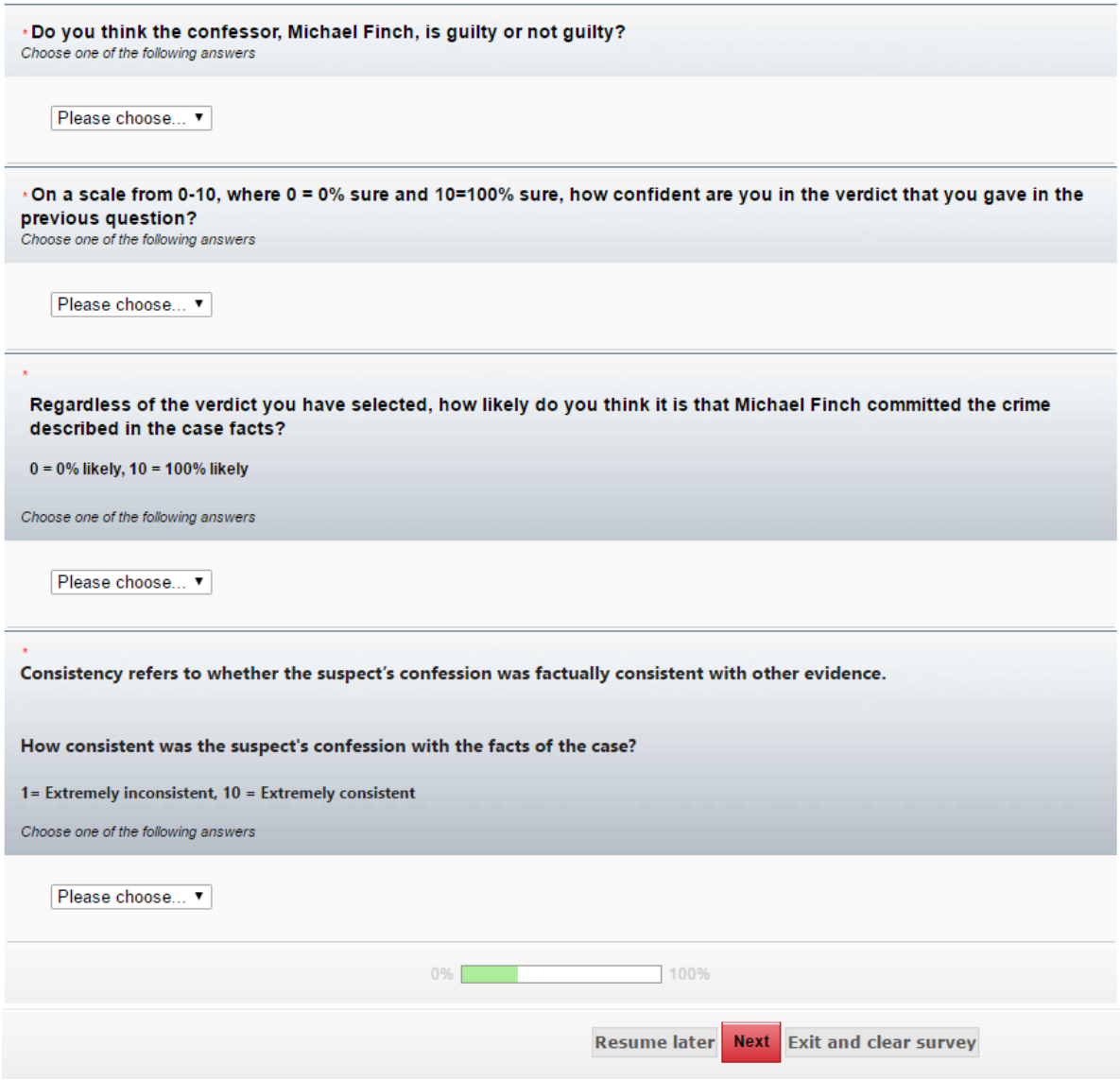
Appendix C

Hypothesis Disconfirmation Intervention



Appendix D

Questionnaire



* **Do you think the confessor, Michael Finch, is guilty or not guilty?**
Choose one of the following answers

Please choose...

* **On a scale from 0-10, where 0 = 0% sure and 10=100% sure, how confident are you in the verdict that you gave in the previous question?**
Choose one of the following answers

Please choose...

*
Regardless of the verdict you have selected, how likely do you think it is that Michael Finch committed the crime described in the case facts?

0 = 0% likely, 10 = 100% likely

Choose one of the following answers

Please choose...

*
Consistency refers to whether the suspect's confession was factually consistent with other evidence.

How consistent was the suspect's confession with the facts of the case?

1= Extremely inconsistent, 10 = Extremely consistent

Choose one of the following answers

Please choose...

0% 100%

Resume later Next Exit and clear survey

Appendix E

Juror Perceptions of Confession Evidence
Participant Information Sheet

Invitation

We would like to invite you to participate in the study named above.

This study is being conducted in partial fulfillment of an Honours degree for Kelly Porter under the supervision of Dr Jim Sauer.

What is the purpose of this study?

This study examines how jurors evaluate evidence and factors that influence perceptions of evidence strength.

Why have I been invited to participate?

You have been invited to participate in this study due to your enrolment in undergraduate Psychology units at the University of Tasmania.

While we would greatly appreciate your participation in this study we do recognise and respect your right not to take part. Please note that you will not be penalised in any way if you choose not to participate in this study, and your relationship with the University of Tasmania will not be affected.

This Participation Information Sheet will explain what is involved with participating in this research task. Knowing what is involved will help you to decide whether or not you would like to participate in this study, so please read this information carefully.

What will I be asked to do?

If you consent to participating in this research study you will be asked to read a page of case facts related to a non-violent crime. You will then be asked to read a confession statement, signed by the defendant in question. You will then be asked a series of questions about the materials you have read and the strength of the evidence against the defendant.

This task is expected to take approximately 15 minutes in total to complete.

Are there any possible benefits from participation in this study?

While there may be no direct benefits of this research study to you as a participant, this study does have potential benefits for the wider community. Understanding how potential jurors evaluate evidence can help to develop methods for presenting evidence within a trial that maximise the quality of juror decision making.

Participants who are enrolled in first year psychology units will have the option to redeem research participation credit from this study.

If you are not a first year psychology student, or wish not to redeem research participation credit, you will be eligible to go in the draw to win a $50 gift voucher to one of the following places: BWS or Coles Myer.

If you would like to enter the draw to win this gift voucher you will just need to tell us your email address at the completion of the survey. Please note that your email address will be stored in a separate data base to your survey questions, and your answers will not be identifiable in any way by providing this information.

Are there any possible risks from participation in this study?

We do not believe that there are any foreseeable risks associated with participating in this study.

What if I change my mind during or after the study?

Please be aware that if you choose to participate in this study, you are free to withdraw at any time before submitting the survey. There will be no penalties, and you can withdraw without providing us with an explanation. If you choose to withdraw prior to submitting to your survey all information you have provided up until that will be destroyed. Please note that once you have submitted your survey it may not be possible to remove your data due to the anonymous nature of responses.

What will happen to the information when this study is over?

All data related to participation in this study will be stored securely in the Psychology department on the Sandy Bay campus of the University of Tasmania. All paper-based surveys will be stored within a locked filing cabinet within a locked office. All electronic files will be stored securely on a password-protected hard drive.

It is recommended that all research data is kept for a minimum of 5 years from the date of first publication. After this time paper-based surveys will be shredded, while online surveys will be erased from the hard drive.

With your permission, we may choose to archive the data from this study for use in future research studies. If you are happy for us to archive your data, please let us know on the consent form.

Please note that all data retained will remain confidential and anonymous.

How will the results of the study be published?

The results of this study will be disseminated in my Honours thesis. The results of this study should be finalised by the end of September 2016. If you would like access to a summary of results please contact either myself (Kelly) at kporter0@utas.edu.au or Dr Jim Sauer at Jim.Sauer@utas.edu.au and we will make this available to you as soon as possible.

Please note that all participants will be unidentifiable in the publication of results.

What if I have questions about this study?

If you have any questions about this study, or would like to report any potential risks that may have been overseen during the design phase, please do not hesitate to contact us.

Dr Jim Sauer

Email: Jim.Sauer@utas.edu.au

Phone: 6226 2051

Kelly Porter

Email: kporter0@utas.edu.au

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on +61 3 6226 6254 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H12662.

Thank you for taking the time to consider participating in this study.

Please note that by continuing with the survey you are consenting to having your responses included in this study.

Appendix F

Ethics Approval

Dear Dr Palmer

Ethics Ref: H0012662
Title: Juror detection of inconsistencies in witness and confession statements

This email is to confirm that the following amendment was approved by the Chair of the Tasmania Social Sciences Human Research Ethics Committee on 15/7/2016:

- Addition of Kelly Porter as a student investigator.
- Revised Information Sheet for Participants.

All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the National Statement on Ethical Conduct in Human Research (NHMRC 2007, updated May 2015).

This email constitutes official approval. If your circumstances require a formal letter of amendment approval, please let us know.

Should you have any queries please do not hesitate to contact me.

Kind regards
Katherine

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Appendix G

Descriptive Statistics for Perceived Confession Consistency

Descriptive Statistics

Dependent Variable: consistency

strength	hyp_dis	Mean	Std. Deviation	N
weak	control	5.3500	2.13431	20
	pre	5.8333	2.11961	24
	post	5.0385	2.19965	26
	Total	5.4000	2.14949	70
strong	control	7.0000	2.27429	30
	pre	6.8077	2.15442	26
	post	6.4348	2.55532	23
	Total	6.7722	2.30356	79
Total	control	6.3400	2.34399	50
	pre	6.3400	2.17227	50
	post	5.6939	2.45122	49
	Total	6.1275	2.32869	149

T-test for Confession Strength and Perceived Confession Consistency

Group Statistics

	strength	N	Mean	Std. Deviation	Std. Error Mean
consistency	weak	70	5.4000	2.14949	.25691
	strong	79	6.7722	2.30356	.25917

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
consistency	Equal variances assumed	.423	.517	-3.744	147	.000	-1.37215	.36647	-2.09638	-.64793
	Equal variances not assumed			-3.760	146.595	.000	-1.37215	.36493	-2.09335	-.65095

2 (Strength) x 3 (Hypothesis Disconfirmation) Bayesian ANOVA for Perceived Confession Consistency

Bayesian ANOVA

Model Comparison - Confession_Consistency

Models	P(M)	P(M|data)	BFM	BF10	% error
Null model	0.200	0.009	0.038	1.000	
Hyp_dis	0.200	0.002	0.007	0.194	0.026
strength	0.200	0.847	22.117	90.904	4.153e −6
Hyp_dis + strength	0.200	0.124	0.566	13.300	1.255
Hyp_dis + strength + Hyp_dis ∗ strength	0.200	0.018	0.074	1.945	2.839

Hierarchical Loglinear Analysis: Strength x Hypothesis Disconfirmation x Verdict

Hierarchical Loglinear Analysis

Data Information

		N
Cases	Valid	149
	Out of Range[a]	0
	Missing	0
	Weighted Valid	149
Categories	strength	2
	hyp_dis	3
	verdict	2

a. Cases rejected because of out of range factor values.

Design 1

Convergence Information

Generating Class	strength*hyp_dis*verdict
Number of Iterations	1
Max. Difference between Observed and Fitted Marginals	.000
Convergence Criterion	.250

Cell Counts and Residuals

strength	hyp_dis	verdict	Observed Count[a]	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
weak	control	.00	11.500	7.7%	11.500	7.7%	.000	.000
		1.00	9.500	6.4%	9.500	6.4%	.000	.000
	pre	.00	14.500	9.7%	14.500	9.7%	.000	.000
		1.00	10.500	7.0%	10.500	7.0%	.000	.000
	post	.00	17.500	11.7%	17.500	11.7%	.000	.000
		1.00	9.500	6.4%	9.500	6.4%	.000	.000
strong	control	.00	10.500	7.0%	10.500	7.0%	.000	.000
		1.00	20.500	13.8%	20.500	13.8%	.000	.000
	pre	.00	7.500	5.0%	7.500	5.0%	.000	.000
		1.00	19.500	13.1%	19.500	13.1%	.000	.000
	post	.00	11.500	7.7%	11.500	7.7%	.000	.000
		1.00	12.500	8.4%	12.500	8.4%	.000	.000

a. For saturated models, .500 has been added to all observed cells.

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	.000	0	.
Pearson	.000	0	.

K-Way and Higher-Order Effects

	K	df	Likelihood Ratio Chi-Square	Likelihood Ratio Sig.	Pearson Chi-Square	Pearson Sig.	Number of Iterations
K-way and Higher Order Effects[a]	1	11	14.858	.189	15.537	.159	0
	2	7	13.757	.056	14.091	.050	2
	3	2	.561	.755	.558	.757	3
K-way Effects[b]	1	4	1.101	.894	1.446	.836	0
	2	5	13.196	.022	13.533	.019	0
	3	2	.561	.755	.558	.757	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

Partial Associations

Effect	df	Partial Chi-Square	Sig.	Number of Iterations
strength*hyp_dis	2	1.096	.578	2
strength*verdict	1	8.432	.004	2
hyp_dis*verdict	2	2.393	.302	2
strength	1	.544	.461	2
hyp_dis	2	.013	.993	2
verdict	1	.544	.461	2

Backward Elimination Statistics

Step Summary

Step[a]			Effects	Chi-Square[c]	df	Sig.	Number of Iterations
0	Generating Class[b]		strength*hyp_dis*verdict	.000	0	.	
	Deleted Effect	1	strength*hyp_dis*verdict	.561	2	.755	3
1	Generating Class[b]		strength*hyp_dis, strength*verdict, hyp_dis*verdict	.561	2	.755	
	Deleted Effect	1	strength*hyp_dis	1.096	2	.578	2
		2	strength*verdict	8.432	1	.004	2
		3	hyp_dis*verdict	2.393	2	.302	2
2	Generating Class[b]		strength*verdict, hyp_dis*verdict	1.657	4	.798	
	Deleted Effect	1	strength*verdict	9.069	1	.003	2
		2	hyp_dis*verdict	3.031	2	.220	2
3	Generating Class[b]		strength*verdict, hyp_dis	4.688	6	.584	
	Deleted Effect	1	strength*verdict	9.069	1	.003	2
		2	hyp_dis	.013	2	.993	2
4	Generating Class[b]		strength*verdict	4.701	8	.789	
	Deleted Effect	1	strength*verdict	9.069	1	.003	2
5	Generating Class[b]		strength*verdict	4.701	8	.789	

a. At each step, the effect with the largest significance level for the Likelihood Ratio Change is deleted, provided the significance level is larger than .050.

b. Statistics are displayed for the best model at each step after step 0.

c. For 'Deleted Effect', this is the change in the Chi-Square after the effect is deleted from the model.

Convergence Information[a]

Generating Class	strength*verdict
Number of Iterations	0
Max. Difference between Observed and Fitted Marginals	.000
Convergence Criterion	.250

a. Statistics for the final model after Backward Elimination.

Cell Counts and Residuals

strength	hyp_dis	verdict	Observed		Expected		Residuals	Std. Residuals
			Count	%	Count	%		
weak	control	.00	11.000	7.4%	14.000	9.4%	-3.000	-.802
		1.00	9.000	6.0%	9.333	6.3%	-.333	-.109
	pre	.00	14.000	9.4%	14.000	9.4%	.000	.000
		1.00	10.000	6.7%	9.333	6.3%	.667	.218
	post	.00	17.000	11.4%	14.000	9.4%	3.000	.802
		1.00	9.000	6.0%	9.333	6.3%	-.333	-.109
strong	control	.00	10.000	6.7%	9.333	6.3%	.667	.218
		1.00	20.000	13.4%	17.000	11.4%	3.000	.728
	pre	.00	7.000	4.7%	9.333	6.3%	-2.333	-.764
		1.00	19.000	12.8%	17.000	11.4%	2.000	.485
	post	.00	11.000	7.4%	9.333	6.3%	1.667	.546
		1.00	12.000	8.1%	17.000	11.4%	-5.000	-1.213

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	4.701	8	.789
Pearson	4.521	8	.807

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
strength * verdict	149	100.0%	0	0.0%	149	100.0%

strength * verdict Crosstabulation

			verdict		
			.00	1.00	Total
strength	weak	Count	42	28	70
		Expected Count	32.9	37.1	70.0
		% within strength	60.0%	40.0%	100.0%
		Standardized Residual	1.6	-1.5	
	strong	Count	28	51	79
		Expected Count	37.1	41.9	79.0
		% within strength	35.4%	64.6%	100.0%
		Standardized Residual	-1.5	1.4	
Total		Count	70	79	149
		Expected Count	70.0	79.0	149.0
		% within strength	47.0%	53.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.985[a]	1	.003		
Continuity Correction[b]	8.027	1	.005		
Likelihood Ratio	9.069	1	.003		
Fisher's Exact Test				.003	.002
Linear-by-Linear Association	8.925	1	.003		
N of Valid Cases	149				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 32.89.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.246	.003
	Cramer's V	.246	.003
N of Valid Cases		149	

2 (Strength) x 3 (Hypothesis disconfirmation) ANOVA on Verdict Preference

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
strength	.00	weak	70
	1.00	strong	79
hyp_dis	.00	control	50
	1.00	pre	50
	2.00	post	49

Descriptive Statistics

Dependent Variable: verdict preference

strength	hyp_dis	Mean	Std. Deviation	N
weak	control	-.4550	7.30828	20
	pre	-.9667	6.53197	24
	post	-1.7462	6.73109	26
	Total	-1.1100	6.75495	70
strong	control	2.6833	6.10389	30
	pre	2.9846	6.18501	26
	post	.1761	6.76940	23
	Total	2.0525	6.36545	79
Total	control	1.4280	6.72107	50
	pre	1.0880	6.59706	50
	post	-.8439	6.74835	49
	Total	.5668	6.71832	149

Levene's Test of Equality of Error Variances[a]

Dependent Variable: verdict preference

F	df1	df2	Sig.
1.603	5	143	.163

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + strength + hyp_dis + strength * hyp_dis

Tests of Between-Subjects Effects

Dependent Variable: verdict preference

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	506.306[a]	5	101.261	2.345	.044	.076
Intercept	29.185	1	29.185	.676	.412	.005
strength	330.942	1	330.942	7.665	.006	.051
hyp_dis	111.229	2	55.615	1.288	.279	.018
strength * hyp_dis	25.695	2	12.848	.298	.743	.004
Error	6173.802	143	43.173			
Total	6727.972	149				
Corrected Total	6680.108	148				

a. R Squared = .076 (Adjusted R Squared = .043)

Estimated Marginal Means

1. strength

Dependent Variable: verdict preference

strength	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
weak	-1.056	.790	-2.618	.506
strong	1.948	.744	.478	3.418

2. hyp_dis

Dependent Variable: verdict preference

hyp_dis	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
control	1.114	.948	-.761	2.989
pre	1.009	.930	-.829	2.847
post	-.785	.940	-2.644	1.074

3. strength * hyp_dis

Dependent Variable: verdict preference

strength	hyp_dis	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
weak	control	-.455	1.469	-3.359	2.449
	pre	-.967	1.341	-3.618	1.685
	post	-1.746	1.289	-4.293	.801
strong	control	2.683	1.200	.312	5.055
	pre	2.985	1.289	.437	5.532
	post	.176	1.370	-2.532	2.884

2 (Strength) x (3 (Hypothesis Disconfirmation) Bayesian ANOVA of Verdict Preference

Bayesian ANOVA

Model Comparison - vpref

Models	P(M)	P(M|data)	BFM	BF10	% error
Null model	0.200	0.083	0.364	1.000	
Hyp_dis	0.200	0.022	0.092	0.269	0.027
strength	0.200	0.728	10.722	8.729	0.001
Hyp_dis + strength	0.200	0.144	0.675	1.730	1.234
Hyp_dis + strength + Hyp_dis ✻ strength	0.200	0.021	0.088	0.257	2.544

2 (Strength) x 3 (Hypothesis Disconfirmation) ANOVA on Perceived Likelihood of Guilt

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
strength	.00	weak	70
	1.00	strong	79
hyp_dis	.00	control	50
	1.00	pre	50
	2.00	post	49

Descriptive Statistics

Dependent Variable: likely_guilt

strength	hyp_dis	Mean	Std. Deviation	N
weak	control	5.6500	2.32322	20
	pre	4.9167	2.56933	24
	post	5.5000	2.48596	26
	Total	5.3429	2.45472	70
strong	control	6.3000	2.18380	30
	pre	6.4231	1.36156	26
	post	5.4348	1.87873	23
	Total	6.0886	1.88237	79
Total	control	6.0400	2.24026	50
	pre	5.7000	2.14999	50
	post	5.4694	2.19945	49
	Total	5.7383	2.19458	149

Levene's Test of Equality of Error Variances[a]

Dependent Variable: likely_guilt

F	df1	df2	Sig.
3.336	5	143	.007

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + strength + hyp_dis + strength * hyp_dis

Tests of Between-Subjects Effects

Dependent Variable: likely_guilt

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	41.610[a]	5	8.322	1.773	.122	.058
Intercept	4773.072	1	4773.072	1016.937	.000	.877
strength	17.820	1	17.820	3.797	.053	.026
hyp_dis	6.316	2	3.158	.673	.512	.009
strength * hyp_dis	15.291	2	7.646	1.629	.200	.022
Error	671.182	143	4.694			
Total	5619.000	149				
Corrected Total	712.792	148				

a. R Squared = .058 (Adjusted R Squared = .025)

Estimated Marginal Means

1. strength

Dependent Variable: likely_guilt

strength	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
weak	5.356	.261	4.841	5.870
strong	6.053	.245	5.568	6.537

2. hyp_dis

Dependent Variable: likely_guilt

hyp_dis	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
control	5.975	.313	5.357	6.593
pre	5.670	.307	5.064	6.276
post	5.467	.310	4.854	6.080

3. strength * hyp_dis

Dependent Variable: likely_guilt

strength	hyp_dis	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
weak	control	5.650	.484	4.692	6.608
	pre	4.917	.442	4.043	5.791
	post	5.500	.425	4.660	6.340
strong	control	6.300	.396	5.518	7.082
	pre	6.423	.425	5.583	7.263
	post	5.435	.452	4.542	6.328

2 (Strength) x 3 (Hypothesis Disconfirmation) Bayesian ANOVA on Perceived Likelihood of Guilt

Bayesian ANOVA

Model Comparison - Likley_Guilt

Models	P(M)	P(M|data)	BFM	BF10	% error
Null model	0.200	0.379	2.443	1.000	
strength	0.200	0.493	3.887	1.300	1.476e −7
Hyp_dis	0.200	0.051	0.217	0.136	0.025
strength + Hyp_dis	0.200	0.055	0.231	0.144	1.296
strength + Hyp_dis + strength ✻ Hyp_dis	0.200	0.022	0.090	0.058	1.769

2 (Strength) x 3 (Hypothesis Disconfirmation) ANOVA on NFC

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
strength	.00	weak	66
	1.00	strong	78
hyp_dis	.00	control	48
	1.00	pre	49
	2.00	post	47

Descriptive Statistics

Dependent Variable: NFC_score

strength	hyp_dis	Mean	Std. Deviation	N
weak	control	9.5263	21.02477	19
	pre	14.3478	16.01876	23
	post	13.1250	14.91516	24
	Total	12.5152	17.08552	66
strong	control	12.0345	20.49300	29
	pre	15.6923	17.38912	26
	post	15.0870	17.69672	23
	Total	14.1538	18.52347	78
Total	control	11.0417	20.51876	48
	pre	15.0612	16.59996	49
	post	14.0851	16.18619	47
	Total	13.4028	17.83582	144

Levene's Test of Equality of Error Variances[a]

Dependent Variable: NFC_score

F	df1	df2	Sig.
.544	5	138	.743

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + strength + hyp_dis + strength * hyp_dis

Tests of Between-Subjects Effects

Dependent Variable: NFC_score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	563.730[a]	5	112.746	.346	.884	.012
Intercept	25059.483	1	25059.483	76.974	.000	.358
strength	133.005	1	133.005	.409	.524	.003
hyp_dis	466.178	2	233.089	.716	.491	.010
strength * hyp_dis	8.033	2	4.016	.012	.988	.000
Error	44926.909	138	325.557			
Total	71358.000	144				
Corrected Total	45490.639	143				

a. R Squared = .012 (Adjusted R Squared = -.023)

Estimated Marginal Means

1. strength

Dependent Variable: NFC_score

strength	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
weak	12.333	2.232	7.919	16.747
strong	14.271	2.052	10.214	18.329

2. hyp_dis

Dependent Variable: NFC_score

hyp_dis	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
control	10.780	2.663	5.515	16.045
pre	15.020	2.582	9.914	20.126
post	14.106	2.632	8.901	19.311

3. strength * hyp_dis

Dependent Variable: NFC_score

strength	hyp_dis	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
weak	control	9.526	4.139	1.341	17.711
	pre	14.348	3.762	6.909	21.787
	post	13.125	3.683	5.842	20.408
strong	control	12.034	3.351	5.409	18.660
	pre	15.692	3.539	8.695	22.689
	post	15.087	3.762	7.648	22.526